

ON THE THYMUS GLAND TREATMENT OF CANCER.*

SECOND PAPER.

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ON Wednesday, May 8, 1907, I presented to this society a case of recurrent cancer of the breast which I had been treating with dried thymus gland of the calf.¹ I also at that time mentioned other cases which had been under the same treatment, and gave the methods of preparation of the glands and the modes of administration.

It is my purpose in this paper to give my experiences with the thymus treatment since that time, feeling that my further investigations have, in part, borne out my first impressions concerning it.

If I report so many deaths of patients while under treatment, I would ask you to consider the class of cases with which I have had to deal; also to bear in mind, in estimating the value of the thymus treatment, the utter hopelessness of every case.

With one exception, every case of cancer which I have treated has been considered inoperable, incurable, and hopeless. The exception was a fairly early case of cancer of the breast, sent in to Bellevue for operation, to which I gave thymus for about a week, in doses running as high as one ounce of powdered thymus. There was no result and the patient was operated upon. Most of the cases have had one or more operations, some have been too far advanced for any operation when first seen by the surgeon, and some

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¹ Reported in the ANNALS OF SURGERY, July, 1907.

have, after operation, had other treatments, such as the X-rays, trypsin, etc., before receiving thymus treatment.

It is natural that I should first take up the history of the case which I presented to you last spring, and bring it to a conclusion.

CASE I.—Mrs. B. *Recurrent cancer of the breast with secondary involvement of the supra- and infraclavicular glands.* (The previous history of this case may be found in the *ANNALS OF SURGERY*, July, 1907.) Patient of Dr. A. E. Isaacs. At the time of presentation the patient showed very marked improvement in that the glands had almost disappeared, pain was less or absent, and the cachexia was markedly diminished. She had had a period of what I thought to be autointoxication from the breaking down of the cancer masses and absorption of the products, and owing to her temperature and desperate illness the thymus was discontinued for two or three weeks (April 25 to date of presentation, May 8). During that period of no treatment the glands had continued decreasing. Two days after exhibition, May 10, the supraclavicular glands showed a marked increase in size, and while she had not entirely recovered from the illness above mentioned, I did not dare wait longer, so she was again put on thymus. The enlargement continued until the 17th, and was accompanied by general pains of a rheumatic character and by sweating, especially at night, but no fever. One locality of the pain was the spleen, which was found by Dr. Block, who was in attendance, to be slightly enlarged.

The glands subsided by the 23rd to where they were on the 8th, and from that time to the end did not again become larger; on the contrary they would sometimes become so small as to be barely palpable.

Medication was continued until about July 15, with no particular change. The general pains and sweating continued, and she did not seem to gain strength following the acute attack. Thymus treatment was discontinued until she should grow stronger, and she went to the country for ten days, gaining generally a good deal, and feeling much better on her return. The glands were still very small. The heat and humidity in the city were at that time intense and she began to fail rapidly. From July 15 to about October 15, when she died, she received no

thymus. During this period of three months she gradually grew weaker, lost a little flesh, had no appetite, there was no great rise in temperature, the pulse was a little rapid, and she had vague pains located at various but changeable places. Dr. Isaacs, Dr. Block and I saw her at times, but could reach no conclusion as to the cause of her condition. It is worthy of remark that during this time her skin remained clear and the mucous membranes quite red. A few days before she died Dr. Isaacs and I examined her and found the glands barely palpable, with no clinical evidences either externally or internally of other metastases. As no autopsy was permitted, we cannot be positive in the conclusion we reached that the cancer process had been stopped and that her death was due to some other cause. There was an hysterical element to be reckoned with. She had had no thymus for three months before her death, which, in the light of other cases, eliminates that as a cause of death. Cancer cachexia was very slight.

In concluding her history I would ask you to compare her cancer condition preceding treatment with that at the time at her death.

CASE II.—Mrs. F. *Cancer of the pelvis*. Patient of Dr. A. Brothers. The patient had had a very complete removal of the pelvic organs several months before, notwithstanding which there was a recurrence within a few months, and in March her abdomen was reopened by Dr. Brothers, under whose care she came at that time, but there was nothing to be done and the incision was closed, healing kindly. When first seen by me, May 14, 1907, the right leg was $2\frac{3}{4}$ to 3 inches larger than the left, and rectal examination showed a hard, nodular, immovable mass extending nearly across the pelvis, fully so in the left side. The patient had great pain in the leg, groin and pelvis, and had been under morphine in increasing doses for several months. X-rays had been administered from April 22 to May 9 with no effect. She was distinctly hysterical.

Thymus was given and continued to June 17 (34 days), the patient dying on June 30. At each weekly visit the mass showed reduction in size and greater mobility until at the last examination, June 11, the reduction amounted to at least 75 per cent., and the growth was freely movable.

Owing to the reduction in the growth and the decrease in

swelling of the leg, the pains which she still complained of were attributed to the desire for morphine which was very pronounced and uncontrollable.

She contracted pneumonia June 17 and died three days later.

CASE III.—Miss D., aged forty-three. Referred by Dr. J. M. Hitzrot. *Carcinoma of the right breast.*² The patient had undergone two operations and had been treated with X-rays. Recurrence in the breast and in the supraclavicular and neck glands, also in the same glands in the left side of the neck, and in the axillary region. Her right arm was greatly swollen from the shoulder to the fingers and showed venous congestion.

Treatment with thymus was begun May 4, from which time until May 31 there was improvement, as evidenced by reduction of the glands and of the swelling of the arm, and by the better circulation both in the arm and generally. Her skin lost its leaden pallor and became healthier looking, while the mucous membranes were quite red.

From June 1 to October 1 the glands showed but slight change, being sometimes a little smaller and again a little larger, but never so large as when first seen. But small impression was made on the swelling of the arm, which may be accounted for by operative interference with the axillary lymphatics and by the contraction of the cicatrix. I have not seen her since October 1, but she reports that she is growing weaker, although there is no increase in the growth. Medication by thymus is still continued, not with any hope of good results, but at her desire, as she says she feels better while taking it.

CASE IV.—Miss P. Case of Dr. J. D. Bryant. *Carcinoma of the left breast*, of very slow growth. Six operations had been performed, the first three years ago. Slow return after each operation. The last operation took place in March, 1906. Has taken morphine judiciously. Commenced thymus about June 15, continued it until about September 1, a period of nine weeks.

The patient is a most intelligent woman, of charming personality, bearing her trouble with great fortitude and patience, and well able to discuss her case and the results of treatment. On October 30 she gave me her general impressions as follows: At first the pain was relieved in part, appetite improved, strength

²The sixth case mentioned in my previous report.

greater, color better. Toward the last of the medication period pain was greater, appetite not so good, and the thymus was taken with difficulty. During the entire time to October 30 there had been little or no increase in growths and certainly not so much as would have taken place without the thymus treatment. The morphine had been increased, with the consequent nausea and lack of desire for food; the thymus powder was disagreeable to her, and as it showed no marked results it was discontinued.

The patient was seen last on December 4. Her general condition was about the same, with locally a slight increase in one of the growths. Greater pain demanded more morphine. Her color was remarkably good.

CASE V.—T. W. Patient of Dr. L. S. Pilcher. *Carcinoma of cæcum and pelvis*. Operation by another surgeon. Came under Dr. Pilcher's care on May 30. Then had a hard mass in the right lower abdomen the size of an orange, and a sinus surrounded by a cauliflower-like growth. Never complained of pain. Thymus medication from June 2 to 28. On the latter date Dr. Pilcher reported to me that the "Patient was discharged at his own request, no appreciable effect having been observed attributable to the treatment."

CASE VI.—M. B. Patient of Dr. L. S. Pilcher. *Carcinoma of the lower jaw and parotid gland*, starting as an epithelioma of the lower lip six years ago. Two operations. When admitted to the hospital and Dr. Pilcher's care, the patient had a large, general, symmetrical swelling covering the ear and lower jaw region. There was a nodular ulcerating surface within the ear. The eye showed neuro-keratitis and ectropion of the lower lid. Pain was slight. Thymus given from June 3 to 28. Dr. Pilcher reported on the latter date, "No good results noticed from treatment; no bad results noticed from thymus ingestion. Growth steadily increased, as also the pain."

CASE VII.—Dr. McM. Referred by Dr. C. H. Mayo. *Cancer of the pancreas*. On July 9 Dr. Mayo operated, finding a condition precluding removal, and the wound was closed. July 24 patient came to me, when thymus was started and continued to August 17. At first there was an improvement in his general condition; color better, appetite better, and pain much less. After two or three weeks the pain returned as bad as ever, appetite dropped to nothing and he lost weight and strength

rapidly. About August 10 a tumor was palpable in the pancreas region which was not to be felt previously. Patient was advised to return home. Later accounts show a progression of the disease, and he died on December 6, 1907.

CASE VIII.—B. W., aged fifty-one. Referred by Dr. Walton Martin. *Carcinoma of cheek*. First symptom noticed March 15, 1907. Two operations, April 7 and May 18. Referred to me May 27. Examination showed a hard, ulcerating mass in right cheek. The neck glands had been removed and there was no recurrence in that region. Medication by thymus was started.

May 31. There was a reduction in the size of the cheek, the mass was softer, and patient could open his mouth wider.

June 3.—The entire right side of the face was much swollen, reddened, hot and tender. He had a high temperature,—in fact all the symptoms of an acute infection.

June 8.—Office treatment being ineffectual, with Dr. Martin's consent the patient was sent to Bellevue Hospital.

July 15.—The inflammatory condition lasted some time, and under this date Dr. Hartwell reported that the patient was failing rapidly. He died August 16, 1907. The thymus was continued to July 1.

CASE IX.—C. J. R. Referred by Dr. R. J. Scofield. *Carcinoma of the floor of the mouth*. First seen on May 9, 1907. The growth began six months previously. There had been no operation. Examination showed a mass filling the entire right side of the floor of the mouth, bringing it even with the lower teeth, and extending somewhat to the left side. The submaxillary, sublingual, and upper cervical glands were enlarged. The patient was unable to masticate. Medication by thymus started on the same date.

May 15.—Eats solid food, feels better, pain is less, growths smaller. Improvement continued until May 27 when, after an evening of alcoholic excess on the 25th, the growths were found larger and patient was unable to take solid food.

June 7.—The growths were again decreasing in size.

June 10.—The growths were larger and the left submaxillary showed an acute inflammatory condition.

October 3.—From preceding date to this there was continuous and rapid growth of the cancer. Treatment was stopped about September 1, since which time the progress has been more

rapid. The patient was alcoholic, and, notwithstanding instructions to the contrary, continued his drinking during treatment.

CASE X.—J. C., aged 55. *Cancer of rectum.* Case of Dr. J. Prescott Grant. First symptoms two and a half years before. Examined by a physician one year ago, sent to a hospital, but growth was considered too far advanced for operation. Six months ago had a left inguinal colostomy performed. Since then has been more comfortable, but has had constant pain and continued loss of weight and strength. He was passing blood and mucus every hour or so, and had been taking morphine daily for months.

Examination when first seen by Dr. Grant, May 28, 1907, showed a hard ring half an inch above the internal sphincter, completely encircling the bowel. Its surface was covered with hard nodules varying in size from that of a hazelnut to that of a walnut. These nodules extended as far as the finger could reach. The whole growth was exceedingly hard and firmly adherent to the adjacent tissues. The examination was painful and was followed by a discharge of blood. The patient was emaciated and a moderate degree of cachexia was present. There was no enlargement of the spleen or liver, and no glands were palpable.

Thymus was begun May 28, 1907. On the fourth day pain was less severe. At the end of the first week the pain was much less and he had taken no morphine for two days. Discharges were less frequent. There was no change in the local condition.

June 11.—There was somewhat more pain and morphine was recommenced. The discharge was increased. His general condition was improved, the patient having a feeling of well being. The nodules were not so hard.

June 28.—General condition improved, discharges less frequent, nodules softer, smaller, and individual nodules movable on base. The patient's condition, both general and local, now remained unchanged for six weeks.

Two weeks later, August 24, making twelve weeks from the first examination, the growth was found diminished in size, the whole mass somewhat movable, and the nodules soft. There was very little pain and no blood on examination.

Patient passes no blood and the ulcerations are apparently healed. There are no metastases palpable. General condition improved.

At the last examination, two or three weeks ago, the whole growth was found elastic and distinctly movable. There were no hemorrhages, no metastases, and the general condition was better than it was five months ago. The patient now takes morphine occasionally, sometimes going two or three days without a dose. Treatment is being continued.

Dr. Grant tells me that there was absolutely no hope from operation when treatment was begun, but he now feels that, if the patient continues to improve generally, an operation would be feasible and advisable.

CASE XI.—Mrs. L., aged sixty-nine. *Carcinoma of breast.* Case of Dr. A. E. Isaacs.

June 12, 1907.—Recently noticed a mass in the left breast the size of a hazelnut, not painful. The lymphatic glands of both supraclavicular regions were enlarged, those in the left side being the larger. The largest glands were the size of a small hazelnut. Weight 149 pounds. No cachexia. Vague history of rheumatism.

June 24.—Treatment with thymus begun.

July 1.—Breast mass larger, supraclavicular glands on left side about the same, on the right side much smaller.

July 29.—Until this date patient felt better and had better appetite. Breast mass showed continued decrease in size, with disappearance of secondary infiltration. The supraclavicular glands on both sides grew gradually smaller and softer. Constipated.

August 5.—Feels pain. Breast mass the same. Supraclavicular glands harder and the right larger.

November 11.—Since August 5 the local conditions have alternated; at one time the masses would be smaller, at another larger; generally speaking, they were no larger than when treatment was begun, five months ago. Her general condition was better and there had been no extension of the process to other glands.

December 9.—Dr. Isaacs writes me that during the last month the patient had failed in every way. The growths were all larger, she was losing flesh, and a marked difficulty in breathing made him think of possible mediastinal metastasis, or pressure on the recurrent laryngeal due to increased size of the deeper neck glands.

He says that notwithstanding the present comparatively poor report, the condition of the original glands is such that were they as they now are when he first saw the patient, he would have offered operation. While, when first seen they were matted together forming masses, now each gland is separate and very freely movable.

CASE XII.—O'C. *Cancer of tongue*. Patient of Dr. John Rogers.

First appearance of growth in August, 1906. Two operations, the second for involvement of the tonsil.

May 15, 1907, when thymus was begun, there was suppuration in the mouth and two or three sinuses in the cheek and beneath the jaw, externally, with a good deal of discharge. The neck glands were involved in the growth and in the ulcerations.

June 15.—Thymus was continued to this date, the patient dying soon after, I believe of pneumonia.

Dr. Rogers reports that pain was relieved in part, the supuration lessened, and for a while the growth was held in check.

CASE XIII.—H. H., aged fifty-eight. *Cancer of pleura*. Case of Dr. W. L. Niles. Cancer history in family. Mother died of cancer of the intestines. Wife had two operations for cancer of the breast, now apparently cured. Rheumatic history.

First symptoms July, 1905. First seen by Dr. Niles October 21, 1907. Diagnosis of epithelioma or endothelioma of pleura was made on October 26, 1907, and confirmed by Dr. W. G. Thompson.

Chest aspirated October 26, and twelve ounces of reddish-brown fluid withdrawn. October 31 thirteen ounces of fluid of the same character.

November 5.—Thymus started. Up to this time the patient was getting worse very rapidly, had very severe pain, took only fluids, and at times was slightly delirious.

November 14.—Improved to this date. Less pain, good appetite, mind clear.

November 15.—Chest filled with fluid very rapidly and his condition again became extreme, and it did not seem possible that he could live twenty-four hours. Thymus stopped.

November 17.—Thymus again started.

December 7.—Since November 17 condition has gradually improved till this date, except emaciation and anæmia, which

have progressed. He has little pain, eats well, mind is active and clear and he sits up in a chair. His general condition was so good that he was permitted to return to his home in Philadelphia.

Dr. Niles sends me the following with his synopsis of the history: "It is my opinion that since using the thymus the new growths have not increased in size and in the cervical region they appear to have diminished. He has had less pain, a better appetite and clearer mentality. Emaciation and anæmia have, however, progressed."

CASE XIV.—J. S. *Carcinoma of the uterus*. Referred by Dr. R. J. Scofield. When first seen by me, May 2, the growth seemed localized to the cervix, but at operation on May 4 the lymphatics were found so affected that, although a complete removal of all the appendages was made, a prognosis of further growth was given Dr. Scofield and the family. The patient was to report to me at the first sign of recurrence.

October 11 she returned, and examination showed a mass low down in the pelvis, extending from the left anterior superior spine to two or three inches beyond the middle line. It was irregularly nodular, hard, and immovable. There was evidence of ulceration in the vagina, and a discharge at times bloody; and swelling of the legs, the right showing the most. There was sharp, cutting, almost continuous pain, and the patient had lost weight rapidly. On her first visit she was almost too weak to travel. Dr. Scofield told me the growth had appeared only recently and had advanced with great rapidity. Thymus was started.

December 12.—Without giving details of her progress, it may be stated that except for occasional setbacks for a few days, she has improved both generally and locally. The growth is half the size it was, there is less discharge, much less pain, her weight is within two pounds of what it was on October 11, her appetite is good, her color is good, and she is much stronger. Treatment has been interfered with at times by a temperature which would reach 102°. She is now running an afternoon temperature of 99° to 100°.

CASE XV.—M. G. *Carcinoma of the intestines and peritoneum*. Admitted to Bellevue Hospital May 11, 1907. First symptoms six months previous to admission. Examination

showed a hard, irregular mass filling the lower abdomen. On rectal examination the mass was found to fill the entire inlet of the pelvis. There was no ascites and no pain.

May 15.—Thymus medication started and continued until May 26. At first patient was more comfortable and felt generally better. Later his abdomen became distended with fluid, and on May 26 sixty-two and a half ounces of fluid were withdrawn. Palpation showed a decided reduction in the growth.

June 4.—Soon after the tapping, the abdomen again filled, the patient became rapidly weaker and he died on this date.

Dr. Frink, the house surgeon, is quite positive that the mass had become very much smaller and much more movable.

CASE XVI.—A. S., aged sixty-six. *Carcinoma of rectum*. First symptoms six months before.

May 3.—Admitted to the surgical service. Examination showed a well-marked growth including the entire circumference of the rectum, firmly fixed, and the lumen so small that it would not admit the little finger. The surface was ulcerating. Examination was painful and followed by blood. The patient complained of great pain and said she habitually passed blood with the stools. She had been under observation in the medical wards for several days and had received frequent doses of morphine to relieve the pain. Thymus medication started.

June 25.—Patient asked for her discharge. The thymus was continued to this date. Several examinations of the rectum were made and at each the mass appeared smaller, softer, less fixed, more movable, and not so painful. The lumen increased so, either from reduction or from ulceration, that the index finger was very freely admitted. Pain was so relieved that I find but nine doses of morphine were administered during this time. I am informed by Dr. Frink, the house surgeon, that most of the time she was up in a chair, and when she left the hospital her general and local conditions were much improved.

In addition to the cases reported, a number of cases were under treatment for a few days only. These I have omitted as they would be of no help in forming opinions. Other cases have been treated under conditions which prevent my presenting sufficient history. Others have been under treatment but a week or two. Of the latter I can say that all

No.	Patient	Referred by	Locality	Operations	Duration previous to treatment	Treatment begun	Duration of treatment	Termination	Results
1	Mrs. B.	Dr. A. E. Isaacs	Breast: return in supraclavicular glands.	2	8 yrs.; 1 yr. since last operation	April 1, '07	3-½ mos.	Death	No treatment for 3 mos. preceding death. At time of death glands barely perceptible, no other metastases, cachexia not nearly so marked as before treatment. No swelling of arm remaining. Growth reduced 75%; movable, swelling in leg diminished.
2	Mrs. F.	Dr. A. Brothers	Pelvic organs.	2	.....	May 14, '07	34 days	Death	Growth of arm continues. Breast about same. Swelling of arm continues. Lymphatics same or smaller. No other metastases. Cachexia at first less, later returned.
3	Miss D.	Dr. J. M. Hinzot	Right breast: return in breast and supra- and infra-clavicular glands both sides.	2	.....	May 4, '07	Continues	.....	Swelling of arm continues. Breast about same. Lymphatics same or smaller. No other metastases. Cachexia at first less, later returned.
4	Miss P.	Dr. J. D. Bryant	Breast: very slow growth.	6	4 yrs.	June 15, '07	9 weeks	.....	General condition about same—no better. Locally slight growth in gland. No new ones showing. Pain greater. Color remarkably good. No results.
5	T. W.	Dr. L. S. Pilcher	Cecum and Pelvis	1	.....	June 2, '07	26 days	Death	No results.
6	M. B.	Dr. C. H. Mayo	Lower jaw and parotid gland.	2	6 yrs.	June 3, '07	25 days	Death	No results.
7	Dr. McL.	Dr. C. H. Mayo	Pancreas	1*	.....	July 24, '07	24 days	Death	No results.
8	B. W.	Dr. W. Martin	Cheek	2	2-½ mos.	May 27, '07	33 days	Death	No result except temporary general improvement.
9	C. J. R.	Dr. R. J. Scofield	Floor of mouth	2	6 mos.	May 9, '07	15 weeks	.....	An acute infection developed. No results from treatment.
10	J. C.	Dr. J. P. Grant	Rectum	1**	2-½ yrs.	May 28, '07	6 mos.	.....	Temporary improvement during first week of treatment.
11	Mrs. L.	Dr. A. E. Isaacs	Breast	.....	.....	June 24, '07	5-½ mos.	.....	General condition improved. Growth smaller, movable, no discharge, no metastases.
12	O.C.	Dr. John Rogers	Tongue	2	1-½ yrs.	May 15, '07	1 mo.	Death	Better until the last month. Now both local and general conditions as bad or worse than at beginning of treatment. Glands remain discrete.
13	H. H.	Dr. W. L. Niles	Pleura	.....	2-½ yrs.	Nov. 5, '07	32 days	.....	Temporary control of growth, and pain partly relieved.
14	J. S.	Dr. R. J. Scofield	Pelvis	1	3-½ mos.	Oct. 11, '07	Continues	.....	No increase in size, cervical glands smaller, less pain, better appetite, clearer mentality.
15	M. G.	Bellevue	Peritoneum	.....	6 mos.	May 15, '07	11 days	Death	Emaciation and anemia increased. Improvement locally and generally. Tumor reduced one half, less pain, more strength.
16	A. S.	Bellevue	Rectum	.....	6 mos.	May 15, '07	22 days	Death	Tumor reduced in size and more movable. Tumor smaller and more movable. General condition better.

*Exploratory

**Colostomy

show the improvement at the beginning which the reported cases show.

Besides cancer, I have treated a few cases of some other conditions in pursuance of the suggestion contained in my first paper that thymus might be applicable to diseases other than cancer. I will say no more at this time than that the cases so treated seem to bear out my previous statement.

The foregoing histories of cancer cases present several prominent points, *viz.*:

1. With the exception of two or three cases, all showed temporary improvement in that there was

- a. Less pain,
- b. Reduction in growth,
- c. General condition better.

This improvement was quite prompt in making its appearance.

2. Several of the patients died or at present writing are near their end.

3. Many of those that died did not succumb as the cancer patient ordinarily does, in that:

- a. There was no great loss of weight,
- b. No leaden pallor and other visible signs of cachexia,
- c. No local increase of the cancer.

On the other hand, at least two of the fatal cases continued fairly well nourished, with clear skin, red mucous membranes, and an actual and marked reduction of the cancer growth, with no evidence of metastases. The same is true of some still living.

4. The deaths were rather peculiar, and must be attributed to one of three causes:

- (1) Progression of the cancer,
- (2) Effects of the thymus treatment,
- (3) Effects of some substance set free by the thymus medication which was not eliminated.

That the fatalities were not due to the first, I can only say that clinical evidences pointing to a progression of the

cancer process were not present, and I am inclined to believe growth and extension had been stopped.

That deaths were due to the thymus treatment directly, I think can be negatively answered by the fact that:

(1) Treatment in some cases had been discontinued for a long period previous to death; in case I for three months.

(2) That other cases, still living, have taken thymus for much longer periods, in as heavy doses, and some are, if anything, holding their own or improving. (See cases III, X, XIV.)

On the other hand, it is possible that the continued use of the thymus has caused the formation of an antibody of such toxicity, persistency and quantity as to cause the condition preceding death.

That the deaths, in some instances, of those having had thymus treatment, may be due to a liberation of some toxic material which is not eliminated, I believe to be possible and fairly probable. This material, added to the constitutional condition which favored or gave rise to the growth of the cancer, was more than the system could stand. I have recognized this as a possible danger and even in my first paper mentioned the great importance of elimination.

The cases may be divided for the purposes of study, and for indications as to the method of administration of the thymus, into two classes:

(1) Cancer in or near the digestive organs,

(2) Cancer not involving the digestive organs.

Illustrative of the first group are the cases of cancer of the cheek (Case VIII), that of the floor of the mouth (Case IX), and that of the pancreas (Case VII). In none of these was the disease checked to any great extent, and the results were the most discouraging of the lot. I attribute the difference in action of the treatment in this class as compared with Class II, to the action of the digestive juices on the thymus powder, and the distinct interference with proper nourishment and assimilation.

The cases of abdominal cancer in a man (Case XV),

and one of the two recurrent cancers in the pelvis (Case II), showed a very rapid reduction with no extension of the growth and rather rapid termination as compared with, for instance, the two cancers of the rectum (Cases X and XVI), which were slower in reduction and one of which, after several months' treatment, is still gaining.

The cases of recurrence of cancer of the breast were still slower in showing effects of treatment and the effects have been more permanent.

All of the cases of the second class showed uniformly a reduction in the growths which did not again enlarge to the size before treatment, and in none of these was there any clinical evidence that metastatic growths had formed since treatment was begun.

The thymus medication has consisted mainly in the administration of the dried gland in powder form. One of the cases received the watery extract of the gland containing nucleo-proteids and other products (prepared practically as reported in my previous paper), given by mouth for a while. Several received the same watery extract hypodermically. The usual dose was one to two drams by weight of the powder three times a day, or the equivalent of one dose hypodermically once a day. I found no advantage in larger doses and but slight results from smaller ones.

The plan I have recently followed, and the one I think best at this writing, is to give the extract hypodermically to cases of cancer in or near the digestive organs, and to give the powder to all others. No difference was noticed in the action, whether given in powder or extract. The hypodermic administration is somewhat painful but never has caused more than a passing redness where injected. I repeat, its use should be limited to cases of cancer in or near digestive organs.

I realize that the thymus treatment has not yet in itself proved curative, and in the search for the necessary adjunct I will mention that I have tried change of climate, getting a temporary improvement in dryer, cooler air than New York

furnished last summer; modifications and limitations in diet, having tried an all-milk diet, a no-milk diet, and at present am trying a diet free from starches and sugars. Neither the all-milk diet nor the no-milk diet seemed to give any particular result. The diet free from starches and sugars is not yet tried out.

I have also tried several drugs in conjunction with the thymus, notably potassium iodide, carbonate of soda, bicarbonate of soda, etc. I am now using the acetate of soda in doses averaging gr. 30, t.i.d., with an idea of eliminating by the kidneys as well as increasing alkalinity. I think there is an undoubted lessened alkalinity of the blood in cancer and it has been my endeavor to increase the alkalinity and oxygen carrying power of the blood, and to promote elimination. I would reiterate the necessity for elimination in every possible way,—by the skin, the bowels, and the kidneys.

Whether it be a drug such as one of the above, whether it be some organic substance other than thymus, or whether it be some special part of the thymus, which is wanting to form the second step in the successful treatment of cancer, I cannot but feel that thymus will be found to be part of the finally accepted treatment.

One can well imagine that with so complex a disease as cancer, it may be a combination of remedies rather than one which eventually gives us control of the disease. On the other hand, it may be one or more of the several constituents of the thymus which are necessary, the others acting either as retarders or actually as antagonists. I have spent a great deal of time trying to separate the different constituents, but owing probably to lack of technical training in physiological chemistry I have failed as yet to produce anything more effectual than the watery extract.

I have been asked why I have not treated cases that were more favorable. I have felt that the best work could be done with advanced cases, and my supply of thymus was so limited that I could not well take more cases. I think all cases admitting of operation should have one, and that

at present there is no remedy which offers so much chance for cure as the knife. The value of thymus will be found in the treatment of cases after an unsatisfactory operation; I mean those cases in which at the time of operation we feel we have not eradicated the entire disease. Inoperable and advanced cases will, I think, be benefitted, their lives prolonged and made endurable, and some such may be so benefitted and the local condition so improved that an operation may be rendered feasible.

The last observation I wish to record has to do with the lasting effects of the treatment. It would seem from my records that either the action of the thymus continues for a fairly long time, or it so alters constitutional conditions that the tendency to growth is stopped. The advantage of this observation will be found in treating post-operative cases which present nothing by which we may judge our progress. That is, it would point to periods of treatment with shorter or longer intervals between.

I would take this opportunity of thanking those sending me cases and those giving the treatment a trial and furnishing me reports of their cases. I would also thank Dr. S. P. Beebe for help from his writings and conversations, Mr. Fetterly of Swift & Co., for facilitating my getting the thymus glands in proper condition, and Mr. H. A. Gardner, of Providence, R. I., for laboratory help.